

## Sulfoxaflor Draft Biological Evaluation Q&A

How do the effects of sulfoxaflor on federally listed endangered and threatened (i.e., listed) species compare to the effects of other pesticides on listed species?

The draft assessment finds that, overall, when compared to older insecticides like the neonicotinoids imidacloprid, clothianidin and thiamethoxam, and organophosphate insecticides malathion, chlorpyrifos and diazinon, sulfoxaflor is less persistent and less toxic to most species, which generally leads to lower risks to human health and the environment.

EPA's draft BE for sulfoxaflor includes findings that sulfoxaflor:

- Will cause no effect to 36 percent of listed species and 52 percent of critical habitats;
- May affect but is not likely to adversely affect 30 percent of listed species and 35 percent of critical habitats; and
- Is likely to adversely affect 34 percent of listed species and 13 percent of critical habitats.
- Of the 34 percent of listed species and critical habitats that sulfoxaflor is likely to adversely affect, EPA predicts that sulfoxaflor:
  - Will not cause jeopardy to 27 percent of listed species;
  - Will not adversely modify 9 percent of critical habitats;
  - May cause jeopardy to 7 percent of listed species; and
  - May adversely modify 4 percent of critical habitats.

The “no effect,” “may affect but not likely to adversely affect,” and “likely to adversely affect” findings in this BE describe the potential effects of sulfoxaflor to at least one individual of a given animal or plant species. In contrast, the predictions of the likelihood of jeopardy and adverse modification (J/AM) describe the potential for effects on entire species populations.

While EPA has completed its J/AM predictions for sulfoxaflor, EPA has not completed its J/AM analysis for imidacloprid, clothianidin and thiamethoxam. Although EPA cannot compare J/AM predictions, the Agency can compare the effects of these pesticides at the individual level. When comparing at the individual level, EPA found that sulfoxaflor was likely to adversely affect fewer species and critical habitats than the neonicotinoids.

EPA's final BEs for the neonicotinoid pesticides imidacloprid, clothianidin and thiamethoxam found that:

- Clothianidin:
  - Will cause no effect to 14 percent of listed species and 17 percent of critical habitats;
  - May affect but is not likely to adversely affect 19 percent of listed species and 27 percent of critical habitats; and
  - Is likely to adversely affect 67 percent of listed species and 56 percent of critical habitats.
- Imidacloprid:
  - Will cause no effect to 11 percent of listed species and 10 percent of critical habitats;

- May affect but is not likely to adversely affect 9 percent of listed species and 7 percent of critical habitats; and
- Is likely to adversely affect 79 percent of listed species and 83 percent of critical habitats.
- Thiamethoxam:
  - Will cause no effect to 12 percent of listed species and 11 percent of critical habitats;
  - May affect but is not likely to adversely affect 11 percent of listed species and 7 percent of critical habitats; and
  - Is likely to adversely affect 77 percent of listed species and 81 percent of critical habitats.

At the individual level, EPA also determined that sulfoxaflor was likely to adversely affect fewer species than three organophosphate insecticides, malathion, chlorpyrifos and diazinon. EPA's final BEs for malathion, chlorpyrifos and diazinon, released in 2017, found that:

- Malathion:
  - Will cause no effect to 1 percent of listed species and 0 percent of critical habitats;
  - May affect but is not likely to adversely affect 2 percent of listed species and 2 percent of critical habitats; and
  - Is likely to adversely affect 97 percent of listed species and 98 percent of critical habitats.
- Diazinon:
  - Will cause no effect to 6 percent of listed species and 10 percent of critical habitats;
  - May affect but is not likely to adversely affect 15 percent of listed species and 41 percent of critical habitats; and
  - Is likely to adversely affect 79 percent of listed species and 49 percent of critical habitats.
- Chlorpyrifos:
  - Will cause no effect to 1 percent of listed species and 0 percent of critical habitats;
  - May affect but is not likely to adversely affect 2 percent of listed species and 2 percent of critical habitats; and
  - Is likely to adversely affect 97 percent of listed species and 98 percent of critical habitats.